

CLAIMS

1. A slidingly engageable fastening device operable upon application of a relative shearing force, comprising:
a first portion that includes:
 - a first base having a first basal surface; and
 - a plurality of first undercut segments spaced from said first basal surface; anda second portion for slidingly engaging with said first portion upon application of a relative shearing force with respect to said first and second portions, said second portion including:
 - a second base having a plurality of fenestrations and a second basal surface;
 - a plurality of stems each having a first end attached to said second base and a second end distal from said second basal surface; and
 - at least one second undercut segment attached to each of said plurality of stems at said second end and extending away from said each stem.
2. A device as in claim 1, wherein said plurality of first undercut segments are arranged in groups of two in a generally bilateral disposition, said first portion further comprising a plurality of pairs of apertures, each of said pairs of apertures associated with a corresponding pair of adjacent ones of said first undercut segments, said plurality of apertures for receiving complementary pairs of said plurality of second undercut segments.
3. A device as in claim 1, wherein said plurality of first undercut segments are arranged in groups of three in a generally triangular disposition, said first portion further comprising sets of three apertures and a plurality of aperture openings each associated with a corresponding one of said sets of three apertures, each of said sets of three apertures and each of said plurality of aperture openings corresponding to a corresponding set of three adjacent ones of said first undercut

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segments, said sets of three apertures for receiving complementary sets of three of said plurality of second undercut segments.

4. A device as in claim 1, wherein said plurality of first undercut segments are arranged in groups of four in a generally quadrille disposition, said first portion further comprising sets of four apertures and a plurality of aperture openings each associated with a corresponding one of said sets of four apertures, each of said sets of four apertures and each of said plurality of aperture openings corresponding to a corresponding set of four adjacent ones of said first undercut segments, said sets of four apertures for receiving complementary sets of four of said plurality of second undercut segments.

5. A device as in claim 1, wherein said plurality of first undercut segments are arranged in groups of six in a generally hexagonal disposition and said plurality of first undercut segments are arranged in sets of three, said first portion further comprising sets of three apertures each associated with a corresponding one of said sets of three first undercut segments and a plurality of aperture openings corresponding to ones of said sets of three apertures, said sets of three apertures for receiving complementary sets of three of said plurality of second undercut segments.

6. A device as in claim 1, wherein said plurality of first undercut segments are each arranged in groups of two in a chevron-like shape, said first portion further comprising a plurality of chevron-shaped apertures and a plurality of chevron-shaped aperture openings each associated with a corresponding one of said plurality of first undercut segments, each of said plurality of chevron-shaped apertures for receiving complementary ones of said plurality of second undercut segments.

7. A device as in claim 1, wherein said plurality of second undercut segments are arranged in groups of two arrayed in rows that include a first row, a second row

located adjacent said first row and a third row located adjacent said first row, said second portion further comprising a plurality of islands each having an island top surface, each of said pairs associated with a corresponding one of said plurality of islands, further wherein a portion of said second basal surface corresponding to said first row is generally coplanar with one of said island top surfaces corresponding to said second row and is spaced from said second basal surface corresponding to said third row by ones of said plurality of stems.

8. A device as in claim 1, wherein ones of said stems are associated with at least two of said plurality of first undercut segments.

9. A device as in claim 1, wherein ones of said stems are associated with at least three of said plurality of first undercut segments.

10. A device as in claim 1, wherein said second portion further comprises a plurality of apertures and said second basal surface includes a means for diverting said plurality of first undercut segments into engagement with corresponding ones of said plurality of apertures.

11. A device as in claim 1, wherein said portion further comprises a plurality of apertures and said second basal surface includes a diverting structure that directs said plurality of first undercut segments into engagement with corresponding ones of said plurality of apertures.

12. A slidably engagable fastening device operable upon application of a relative shearing force, including:

a first portion comprising:

a first base having a first basal surface; and

at least one first island attached to said first base, said at least one first island

having at least one undercut segment spaced from said first basal surface;

and

a second portion for slidingly engaging with said first portion upon application of a relative shearing force with respect to said first and second portions, said second portion including:

a second base having a plurality of fenestrations and a second basal surface;

a plurality of second islands attached to said second base and defining at least one aperture for receiving said at least one first island.

13. A device as in claim 12, wherein said plurality of first islands and said plurality of second islands are each configured in a generally bilateral disposition, said first portion further comprising a plurality of first apertures each defined by a corresponding pair of adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by a corresponding pair of adjacent ones of said plurality of second islands.
14. A device as in claim 12, wherein said plurality of first islands and said plurality of second islands are each configured in a generally triangular disposition, said first portion further comprising a plurality of first apertures each defined by three corresponding adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by three corresponding adjacent ones of said plurality of second islands.
15. A device as in claim 12, wherein said plurality of first islands and said plurality of second islands are each configured in a generally quadrille disposition, said first portion further comprising a plurality of first apertures each defined by four corresponding adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by four corresponding adjacent ones of said plurality of second islands.

16. A device as in claim 12, wherein said plurality of first islands and said plurality of second islands are each configured in a generally hexagonal disposition, said first portion further comprising a plurality of first apertures each defined by three corresponding adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by three corresponding adjacent ones of said plurality of second islands.
17. A device as in claim 12, wherein said plurality of first islands and said plurality of second islands are each configured in a generally chevron-like disposition, said first portion further comprising a plurality of first apertures each defined by a corresponding adjacent one of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by a corresponding adjacent one of said plurality of second islands.
18. A device as in claim 12, wherein said plurality of first islands and said plurality of second islands are each arrayed in rows that include a first row, a second row located adjacent said first row and a third row located adjacent said first row, ones of said first and second pluralities of islands each having an island top surface, further wherein a portion of said second basal surface corresponding to said first row is generally coplanar with one of said island top surfaces corresponding to said second row and is spaced from said second basal surface corresponding to said third row.
19. A double-sided interlocking fastening device, comprising:
a base having a first basal surface and an opposing second basal surface;
a plurality of first islands attached to said base and extending away from said first basal surface;
a plurality of second islands attached to said base and extending away from said second basal surface generally opposite said plurality of first islands;

wherein sets of two adjacent said first islands and sets of two adjacent said second islands each define apertures for receiving and slidingly engaging with one another.

20. A device as in claim 19, wherein said plurality of first islands and said plurality of second islands are each configured in a generally bilateral disposition, said first portion further comprising a plurality of first apertures each defined by a corresponding pair of adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by a corresponding pair of adjacent ones of said plurality of second islands.
21. A device as in claim 19, wherein said plurality of first islands and said plurality of second islands are each configured in a generally triangular disposition, said first portion further comprising a plurality of first apertures each defined by three corresponding adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by three corresponding adjacent ones of said plurality of second islands.
22. A device as in claim 19, wherein said plurality of first islands and said plurality of second islands are each configured in a generally quadrille disposition, said first portion further comprising a plurality of first apertures each defined by four corresponding adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by four corresponding adjacent ones of said plurality of second islands.
23. A device as in claim 19, wherein said plurality of first islands and said plurality of second islands are each configured in a generally hexagonal disposition, said first portion further comprising a plurality of first apertures

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each defined by three corresponding adjacent ones of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by three corresponding adjacent ones of said plurality of second islands.

24. A device as in claim 19, wherein said plurality of first islands and said plurality of second islands are each configured in a generally chevron-like disposition, said first portion further comprising a plurality of first apertures each defined by a corresponding adjacent one of said plurality of first islands and said second portion further comprising a plurality of second apertures each defined by a corresponding adjacent one of said plurality of second islands.

25. A slidingly engageable fastener, comprising:

a first portion that includes:

a base having a first basal surface and a second basal surface opposite said first basal surface; and

a plurality of first islands attached to said base and extending away from said first basal surface, wherein sets of two adjacent said first islands each define an aperture for receiving and slidingly engaging with a plurality of second islands; and

a plurality of attachment devices engaging said first portion and extending away from said second basal surface.

26. A slidingly engageable fastener as in claim 25, wherein said plurality of attachment devices is a set of nail-like devices.

27. A slidingly engageable fastener as in claim 25, wherein said plurality of attachment devices is a set of riveting devices.

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28. A slidingly engageable fastener as in claim 25, wherein said plurality of attachment devices is a set of expansion devices.

29. A slidingly engageable fastener as in claim 25, wherein said plurality of attachment devices is a set of friction fitting devices.

30. A slidingly engageable fastener as in claim 25, wherein said plurality of attachment devices is a set of folding devices.

31. A fastening device secured to a substrate material, comprising:
a first portion that includes:

a first base having a first basal surface and a second basal surface spaced from said first basal surface; and

a plurality of first islands attached to said first base and extending away from said first basal surface, wherein adjacent pairs of said plurality of first islands each define an aperture for receiving, and interlocking with, a plurality of second islands; and

a backing structure for confronting said second basal surface and being attachable to said first portion, said backing structure for securing said first portion to the substrate material when said backing structure is attached to said first portion.

32. A fastening device as in claim 31, wherein ones of said first plurality of islands include receptors having corresponding receptor openings located on said second basal surface and wherein said backing structure comprises a set of pins corresponding to said receptors.

33. An interlocking device for engaging a plurality of first islands, comprising:
a base having a plurality of fenestrations and a basal surface; and
a plurality of second islands attached to said base and defining a plurality of apertures for receiving the plurality of first islands, each of said plurality of

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second islands including at least three of said undercut segments spaced from one another.

34. An interlocking device for engaging a plurality of first islands, comprising:
a base having a plurality of fenestrations and a basal surface; and
a plurality of second islands attached to said base and defining a plurality of apertures for receiving the plurality of first islands, said plurality of second islands including undercut segments spaced from one another;
wherein at least two of said undercut segments extend over each of at least some of said plurality of fenestrations.

35. A method of molding a structure that includes a base having a plurality of fenestrations and a plurality of islands integral with the base, each of the plurality of islands having a plurality of undercut segments, comprising the steps of:
providing a first die having a molding axis and a plurality of gates each defining a corresponding one of the plurality of fenestrations and at least a portion of one of the plurality of undercut segments, each of said plurality of gates having a contact surface substantially perpendicular to said first molding axis;
providing a second die having a plurality of contact regions each for engaging a corresponding one of said plurality of gates at said first surface; and
engaging said first die and said second die with one another substantially along said molding axis such that said contact surface of said first die engages said contact region of said second die.

36. A method of producing a structure that includes a base having a plurality of fenestrations and further includes a plurality of islands integral with the base, each of the plurality of islands having a plurality of undercut segments, comprising the steps of:
providing a first die having a molding axis and a plurality of gates each defining a corresponding one of the plurality of fenestrations and at least a portion of one

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of the plurality of undercut segments, each of said plurality of gates having a contact surface substantially parallel to said molding axis;
providing a second die having a plurality of contact regions each for engaging a corresponding one of said plurality of gates at said contact surface; and
engaging said first die and said second die with one another substantially along said molding axis such that said contact surface of said first die engages said contact region of said second die.

37. A method of molding a structure, comprising the steps of:
providing a first rotating mold that includes at least one first die having at least one gate;
providing a second rotating mold that includes at least one second die corresponding to said at least one first die, said second die having at least one first cavity;
engaging said at least one first die with said at least one second die such that said at least one gate is received within said at least one first cavity, thereby defining at least one second cavity within said at least one first cavity; and
providing a flowable material to said at least one second cavity.

38. A method according to claim 37 wherein at least one of said first and second rotating molds is a continuous belt-mold .

39. An apparatus for molding a structure that includes a base having a plurality of fenestrations and further includes a plurality of islands integral with the base, each of the plurality of islands having a plurality of undercut segments, comprising:
a first die having a molding axis and a plurality of gates each defining a corresponding one of the fenestrations and at least a portion of one of the plurality of undercut segments, each of said plurality of gates having a contact surface substantially perpendicular to said first molding axis;
a second die having a plurality of contact regions each for engaging a corresponding one of said plurality of gates at said first surface; and

a mechanism for engaging said first die and said second die with one another substantially along said molding axis such that said contact surface of said first die engages said contact region of said second die.

40. An apparatus for molding a structure that includes a base having a plurality of fenestrations and further includes a plurality of islands integral with the base, each of the plurality of islands having a plurality of undercut segments, comprising:
a first rotating mold that includes at least one first die having at least one gate;
a second rotating mold that includes at least one second die corresponding to said at least one first die, said second die having at least one first cavity;
wherein said at least one first die is engagable with said at least one second die such that said at least one gate is received within said at least one first cavity, thereby defining at least one second cavity within said at least one first cavity;
and
a mechanism for providing a flowable material to said at least one second cavity.

41. An apparatus as in claim 40 wherein at least one of said first and second rotating molds is a continuous belt-mold.

42. An apparatus for forming a structure that includes a base having a plurality of fenestrations and further includes a plurality of islands integral with the base, each of the plurality of islands having a plurality of undercut segments and a thickness, comprising:

a first die having a forming axis and a plurality of punching segments each defining a corresponding one of the fenestrations and at least a portion of ones of the plurality of undercut segments, each of said plurality of punching segments having a punching surface generally perpendicular to said forming axis;

a second die having a plurality of cavities each for receiving a corresponding one of said punching segments, said punching segments

extending into said cavities by a distance at least equal to said island thickness: and

a mechanism for engaging said first die and said second die with one another substantially along said forming axis so as to form a malleable material into the shape of said structure.

43. An apparatus for forming a structure that includes a base having a plurality of fenestrations and further includes a plurality of islands integral with the base, each of the plurality of islands having a plurality of undercut segments, comprising:

a first roller that includes at least one first die having at least one punching segment;

a second roller that includes at least one second die corresponding to said at least one first die, said second die having at least one first cavity;

wherein said at least one first die is engagable with said at least one second die such that said at least one punching segment is received within said at least one first cavity, thereby defining at least one second cavity within said at least one first cavity; and

a mechanism for forming a maleable material within said at least one second cavity.

44. A product, comprising:

a slidably engagable fastener that includes:

a first portion comprising:

a first base having a first basal surface; and

a plurality of first undercut segments spaced from said first basal surface; and

a second portion for slidably interlocking with said first portion upon application of a force to one of said first and second portions in a direction generally parallel to said first basal surface, said second portion including:

a second base having a plurality of fenestrations and a second basal surface;

a plurality of stems each having a first end attached to said second base and a second end distal from said second basal surface; and

at least one second undercut segment attached to each of said plurality of stems at said second end and extending away from said each stem.

45. A product as in 44, further comprising a component having a third portion and a fourth portion spaced from said third portion, said third portion containing said first portion and said fourth portion containing said second portion.

46. A product as in claim 45, wherein said component includes an elastic section located between said third and fourth portions.

47. A product as in claim 44, comprising two or more components wherein said first and second portions are located on diverse ones of said two or more components.

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